NASA Science Mission Directorate - Applied Sciences Program

Coastal Management – Fiscal Year 2005 Annual Report [*]

SUMMARY

The Coastal Management program element made progress to support use of NASA Earth science observations and models in coastal management. A Coastal Management project provided daily, near-real-time MODIS ocean data products as well as multi-temporal animation products fused with Navy Coastal Ocean Model (NCOM) modeling outputs to NOAA's Harmful Algal BloomS Observing System (HABSOS) for use by Gulf of Mexico coastal resource managers. This project also provided system training to employees at Naval Research Lab (NRL), NOAA, and other organizations to extend derived Earth science products into HABSOS (including related HAB Mapping System, HAB Bulletin, and HAB Forecasting System). Building on the FY04 evaluation report of HAB decision support systems, the Coastal Management team developed a joint agency work plan and completed the verification and validation (V&V) assessment of REASoN project contributions to HABSOS.

The Coastal team completed a white paper on potential applications of Earth science results to regional sediment management systems and a report on decision support systems related to sea level change. During the Applied Sciences Program's development of a rapid prototyping capacity in FY05, the coastal management activities served as an initial pathfinder application. Through the Decisions solicitation, the Coastal Management program added three one-year projects to its portfolio (oil spills, marine mammal avoidance, and coastal pollution), which begin in FY06. The Coastal Management program frequently participated in NASA's activities to support the Administration's Ocean Action Plan, especially the Subcommittee on Integrated Management of Ocean Resources and the Gulf of Mexico Alliance.

MAJOR ACCOMPLISHMENTS

REASoN: Progress on Incorporating Earth Science Results in HAB Bulletin/Mapping System

NASA and the NRL/Applied Coherent Technologies (ACT) REASoN team integrated real-time ocean measurements from NASA and NOAA satellites, available coastal observations, and coastal ocean model outputs into the NOAA HABSOS automated near-real-time data base and distribution system for the Gulf of Mexico, the HAB Bulletin, and the HAB Mapping System. The HAB Bulletin provides near real-time information on bloom location, wind speed and direction, satellite chlorophyll estimates, and bloom spatial coverage to the Gulf of Mexico coastal community. The REASoN project also worked to enhance future HAB Bulletins through integration of MODIS ocean data products and NCOM modeling output. *http://www.csc.noaa.gov/crs/habf/habmaps.html* and *http://www.ncddc.noaa.gov/habsos*

Coastal Management a Pathfinder in Rapid Prototyping Capacity

The Coastal Management program element served as a pathfinder in the Applied Sciences Program's development of a Rapid Prototyping Capacity (RPC), specifically focusing on the verification and validation of Earth science products in HAB decision support tools and the Coral Reef Early Warning System (CREWS). The purpose of a RPC is to quickly evaluate Earth science results for their value to a decision support system, propose configurations of the results, and assess the any improvements to determine if a more significant project is appropriate. In FY05, the RPC activities with Coastal

[*] The FY05-09 Coastal Management Program Element Plan is available through: http://aiwg.gsfc.nasa.gov/dss.html

Management specifically focused on the verification and validation of REASoN-project contributions to HABSOS. The RPC of Earth science products in HABSOS enabled a demonstration of additional desired functionality that is not presently available using the current software configuration of HABSOS. In addition, the Coastal team developed a joint agency plan for the V&V of the Coral Reef Early Warning System (CREWS) with a strong RPC component. *http://www.coral.noaa.gov/crews/*

ADDITIONAL ACHIEVEMENTS

The Coastal Management team completed the following significant products in FY05:

- White paper on decision support systems related to sea level change. This paper discussed decision support systems used to assess sea level change, reviewed needs and requirements for the monitoring and assessment of sea level change, and discussed the potential for NASA Earth science research results to contribute to decision support systems for sea level change assessment. The paper specifically recommends that WAVe-Current Information System (WAVCIS) be considered as a decision support system with potential for enhancement via NASA contributions.
- White paper on the U.S. Army Corps of Engineer's Regional Sediment Management System (RSMS). This paper reviewed the RSMS decision support tool and discusses the potential for current and planned NASA Earth science results, products, and modeling output to contribute. *http://aiwg.gsfc.nasa.gov/dss.html*
- Report on an assessment of Federal agency strategic plans related to coastal management. This report reviewed strategic plans of Federal agencies involved with coastal management in order to identify common goals and potential for partnership. The report also discussed NASA's participation in national and international non-governmental organizations involved with coastal management.

In addition, the team supported numerous interagency activities that served to demonstrate NASA's role and commitment in the coastal community:

- Ocean Action Plan & SIMOR: The Coastal Management program participated in supporting NASA's contributions to the Administration's Ocean Action Plan, especially the Subcommittee on Integrated Management of Ocean Resources.
- Gulf of Mexico Alliance: The Coastal Management team attended meetings and participated in teleconferences regarding planning and collaborative work by the Gulf of Mexico Alliance partners. *http://www.gulfofmexicoalliance.org/index.html*
- April 2005: The Coastal Management team presented Earth science applications activities at the Ocean Color Research Team Meeting. The talk emphasized NASA activities related to the Research & Operations activities undertaken by NASA and NOAA to streamline the transition between operations and research.
- July 2005: The Coastal Management team attended the NOAA Coastal Zone 2005 conference. The meeting presented numerous opportunities to engage coastal resource managers on the use of NASA Earth science results.
- July 2005: The Coastal Management team attended the 2005 ESRI User Conference, presenting a poster on remote sensing techniques for producing coastal land water masks.

SOLICITATIONS

Decisions CAN

The Coastal Management program element received 33 Step-1 proposals in the Decisions CAN and encouraged 15 to submit full proposals. In Step-2, Coastal Management received 18 full proposals, including 7 that overlapped significantly with the Ecological Forecasting program and 4 with the Disaster Management program. Following the panel reviews and internal assessment for programmatic balance, the Applied Sciences Program did not select any Coastal Management proposals for awards since the higher-scoring coastal proposals did not align with the Program's FY05 direction and priorities.

The Applied Sciences Program later selected additional proposals for one-year awards from a Congressionally-directed augmentation, including three projects for the Coastal Management portfolio:

> MODIS Products to Improve the Monitoring of Gas Flarings from Offshore Oil and Gas Facilities
> *PI: Sonia Gallegos, Naval Research Laboratory*
>
> Impacts of NASA Data and Models on Decision Support Tools in Prince William Sound and Alaska Coastal Oceans
> *PI: Stephen Okkonen, University of Alaska–Fairbanks*
>
> Predicting Right Whale Distributions from Space: An Operational System for Marine Ecosystem Modeling
> *PI: Andrew Pershing, Cornell University*

ROSES 2005 – Section A.24

For the Applied Sciences portion of the ROSES 2005 NRA, the Coastal Management program element received 11 Step-1 proposals (five overlapped with other applications) and encouraged 8 to submit full proposals. The Step-2 proposals were due in November 2005 with selections expected by April 2006.

PUBLICATIONS & CONFERENCE/WORKSHOP PRESENTATIONS (SELECTED)

Arnone, R. A., A. R. Parsons, D. S. Ko, B. Casey, S. Ladner, R. H. Preller, and C. M. Hall. 2005. "Physical and bio-optical processes in the Gulf of Mexico - Linking real-time circulation models and satellite bio-optical and SST properties," presented at the *8th International Conference for Marine and Coastal Environments*, May 17–19 in Halifax, Nova Scotia.

Blain, C. A., R. A. Arnone, and R. W. Gould. 2005, "High resolution coastal circulation: Merging models and ocean color data," presented at the *8th International Conference for Marine and Coastal Environments*, May 17–19 in Halifax, Nova Scotia.

Friedl, L., C. Hall. 2005, "Extending the Use of NASA Research Results for Coastal Management Decision Support," *Earth Observation Magazine*, XIV**.**

McPherson, T., R. Beard. 2005, "NASA-NOAA Collaboration on the Harmful Algal BloomS Observing System (HABSOS)," Presentation, Gulf of Mexico Program Management Committee Meeting, April 12-13, 2005.

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